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Division of Wildlife Conservation
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Population Ecology and Spatial Dynamics of Wolves Under Intensive Management in the Nelchina Basin, Alaska

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Research Performance Report
1 July 2000–30 June 2001
Federal Aid in Wildlife Restoration
Grant W-27-4, Project 14.21

This is a progress report on continuing research. Information may be refined at a later date.

ALASKA DEPARTMENT OF FISH AND GAME
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PROJECT TITLE: Population ecology and spatial dynamics of wolves under intensive management in the Nelchina Basin, Alaska

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COOPERATORS: None

GRANT AND SEGMENT NR.: W-27-4

PROJECT NR.: 14.21

SEGMENT PERIOD: 1 July 2000–30 June 2001

STATE: Alaska

WORK LOCATION: Western Unit 13

I. PROGRESS ON PROJECT OBJECTIVES

OBJECTIVE 1: Determine the year-round prey selection patterns and kill rates of wolf packs relative to varying densities and distributions of prey (i.e., functional response), primarily moose and caribou in and near the core calving areas.

Emphasis was placed of developing methods for monitoring kill rates and diet through the use of VHF telemetry and GPS telemetry systems, stable isotope analysis, and body composition measurements. Two to four wolves from each of several packs were radiocollared. During the year we regularly located all collared wolves and back-tracked the movements of the GPS-collared animals to determine their use of different prey items. We sampled blood for stable isotope analysis and conducted deterium water dilution for analysis of body condition before and after calving.

OBJECTIVE 2: Investigate wolf movements and spatial relationships with prey.

We used VHF and GPS radio collars to monitor the movements of 2–4 wolves in each of several packs regularly during the year. Spatial analysis techniques to measure wolf movements relative to the availability of moose and caribou were investigated.

OBJECTIVE 3: Evaluate diet and body composition of wolves relative to prey availability.

Stable isotope and body condition analysis was focused on 3 periods relative to prey (moose and caribou) availablity: (1) April — pre-calving and before caribou arrive in the

area, (2) July — post-calving for both prey species, and (3) October — autumn/early winter after caribou have left the area. We concentrated on developing field techniques and on obtaining paired samples.

OBJECTIVE 4: Estimate wolf density relative to varying prey densities (i.e., numerical response).

We conducted a density estimate (using a sample-unit probability estimator (SUPE) of wolves in an approximately 6000-km^2 area in the core part of the study area in western Unit 13. Estimates of moose and caribou density were conducted by cooperators.

OBJECTIVE 5: Estimate production, survival, and recruitment of wolves relative to varying prey densities.

During April captures we used ultrasound techniques to examine pregnancy and the number of fetuses in female wolves. We also monitored den sites to estimate pup production, and we documented loss of wolves from dispersal and harvest by humans.

II. SUMMARY OF WORK COMPLETED ON JOBS IDENTIFIED IN ANNUAL PLAN THIS PERIOD

JOB 1: Development of Research Project Statement

A detailed project statement was prepared and distributed for peer review.

JOB 2: Capture and Handling

During this performance period, we captured 17 wolves (8 females, 9 males) among 6 packs: Big Bend, B-S Lakes, Goose Creek, Moore Lake, Old Man Lake, and Sanona Creek. We deployed 5 GPS collars (Televilt/Telemetry Solutions) on 6 wolves for varying lengths of time and collared the remaining wolves with conventional VHF collars (Telonics). We attached GPS collars on 2 wolves in both the Sanona Creek and Moore Lake packs at different times. We attached 1 on of each of the other packs, except the B-S Lakes Pack. For each wolf we measured weight (with an electronic load cell) and body size, estimated age (based on tooth wear), applied ear tags and a radio collar, extracted blood for stable isotope analysis as well as for potential DNA and disease analysis, and noted general physical condition. We conducted deuterium water dilution tests on 8 wolves.

JOB 3: Prey Selection Patterns and Kill Rates

Location data collected by the GPS collars was remotely downloaded from the air and used to backtrack the movements made by the wolves during the previous week. Location data collected in summer–winter 2000 were spaced at 2-hour intervals. This interval proved to be too long to allow us to backtrack the wolves with confidence because of the number of gaps in the location points. Collars deployed before calving in April 2001 were set to gather locations every ½ hour. Using this interval we were able to backtrack the movements of collared wolves with relatively few gaps in their travel routes. We followed those routes and recorded their visits to sites of freshly killed or older carcasses of moose or caribou. We also recorded kill sites discovered during telemetry flights of the VHF collars. Remote download of GPS data was done weekly during calving and at 2–4-week intervals at other times. GPS download and backtracking flights took 2 days to complete. Conventional VHF

locations were obtained nearly daily for most wolves during calving and up to 2–4-week intervals otherwise.

JOB 4: Movements and Spatial Relationships with Prey

The GPS data downloaded remotely or directly from collars and data gathered through conventional VHF collars were compiled for comparative analyses with the movements of radiocollared moose and caribou. Data were collected on the schedule described above.

JOB 5: Diet and Body Composition

We collected blood and hair samples from each of the wolves captured during summer 2000 and spring 2001. We did not attempt to capture wolves in October 2000. Samples were prepared in the lab for analysis of the presence of carbon and nitrogen isotopes that have specific signatures for moose, caribou, and other potential prey. We conducted deuterium water dilution tests on 8 wolves (5 females, 3 males). Each test took approximately 2 hours to complete. After injection of the deuterated water, blood samples were taken at ½-hour intervals for up to 120 minutes. Blood samples were preserved for analysis to estimate water, lipid, protein, and ash content of each animal.

JOB 6: Density Estimation

We conducted a SUPE to estimate wolf density in a 5967-km^2 area in western Unit 13 on 14–15 February 2001. The sampled area was the southeastern portion of an 11,810- km^2 area, which includes western Unit 13A and small portions of southwestern Unit 13B and eastern Unit 13E. The northernwestern portion could not be surveyed due to unacceptable snow and weather conditions. For the southeastern portion, we surveyed 144 samples units (SUs), each of which was 41.4 km^2 or 16 mi^2. This survey took 42 flight hours in Super Cubs for an average of 14 hours/plane. During the survey we observed 54 wolves (based on direct sightings of the animals or their tracks) among 8 groups or packs. Pack sizes ranged from 2 to 15 wolves. We derived estimates of 57.06 ± 4.69 wolves for the area at a density of 9.56 ± 0.78 wolves/1000 km^2. The estimated number of packs was 8.85 ± 1.02 at a density of 1.48 ± 0.17 packs/1000 km^2. The estimated size of wolf packs in the area was 6.44 ± 0.53 wolves.

JOB 7: Production, Survival, and Recruitment

We used ultrasound techniques to examine 4 female wolves for pregnancy during captures on 9 and 11 April 2001. Only one of the females was pregnant, with 4 embryos on the right side and 2 on the left. The pregnant female (NW008) was 6–7 years old while the other 3 were 2–3 years old. Another female (NW015) that was caught on 12 April was not examined by ultrasound but seemed to be pregnant, based on her swollen abdomen and the presence of a milky exudate from her teats. This female was aged at 4 years. Two pups were later seen at the den of NW008's pack and 5 were seen at the den of NW015's pack. Six of the 17 wolves died during this performance period. Five wolves were taken by trappers during the winter of 2000–2001. Three of those were from the Sanona Creek Pack, which lost all 12–15 members of the pack to trapping. One 2-year-old female was apparently killed by another wolf. A seventh wolf, a 2–3 year old male, dispersed from the Goose Creek Pack to establish a new pack to the west.

JOB 8: Publications and Meetings

One paper was prepared and submitted for publication (see below).

III. ADDITIONAL FEDERAL AID-FUNDED WORK NOT DESCRIBED ABOVE THAT WAS ACCOMPLISHED ON THIS PROJECT DURING THIS SEGMENT PERIOD

None

IV. RECOMMENDATIONS FOR THIS PROJECT

We recommend purchasing 2 more GPS collars and deploying up to 7 of them among wolves in 5 packs. We also recommend maintaining 2–4 VHF collars on wolves in each of 5–7 packs.

V. PUBLICATIONS

In review

White, K. S., H. N. Golden, Kris J. Hundertmark, and G. R. Lee. Predation by Wolves, *Canis lupus*, on Wolverines, *Gulo gulo*, and an American Marten, *Martes americana*, in Alaska. Canadian Field-Naturalist 000:000-000.

We report here on 3 instances of Wolf predation on mustelids in southern Alaska; 2 involving Wolverines and another involving an American Marten. Such observations are rare but have usually been documented indirectly in previous studies. This account provides insight into the potential role of Wolves in influencing mesocarnivore communities in northern environments.

VI. FEDERAL AID TOTAL PROJECT COSTS FOR THIS SEGMENT PERIOD

$78.5

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